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## PATENT SPECIFICATION

DRAWINGS ATTACHED

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International Classification—E05c (E05d, F06b).

### COMPLETE SPECIFICATION

#### Improvements in or relating to Bolt Devices

I, ERICH HENSEL, of 77, Richthofenstrasse, Detmold, Germany, a citizen of the Federal Republic of Germany, do hereby declare the invention for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to bolt devices which may be used as hinge pivots for a door or window.

The invention consists in a bolt device comprising a bolt member slidably movable in a guide member therefor, the guide member being of resilient material and having a slot engaged by a projection of the bolt member to define two different positions of the bolt member, the slot in the guide member being open to the free end of the guide member by a restricted opening, the restricted opening being too narrow to allow unintended passage therethrough of the projection of the bolt member but allowing intentionally passing the projection therethrough on yielding of the guide member wall. Preferably, the portions of the bolt member at each side of the projection are of different length and/or of different cross sectional form, whereby the degree of extension of the bolt member from the guide member, when in one of the two positions, or the cross-sectional form of the extending portion is changeable by inverting the bolt member in the guide member.

A detent notch or protrusion may be provided at a part of the slot, for engaging a detent protrusion or recess, respectively, on the projection of the bolt member, whereby to retain the bolt member in a predetermined position relative to the guide member. Preferably two detent notches or detent protrusions are provided and so positioned that the bolt member is retainable selectively at the said two positions.

The detent protrusion or recess on the

projection of the bolt member may be provided thereon only at that face thereof which faces the edge of the slot which has the detent recesses or protrusions, respectively, when the bolt member is in its non-inverted position, whereby on inversion of the bolt member in the guide member, the retaining action is not exercised. The other edge of the slot may have a longitudinally extending recess of a length sufficient to accommodate the detent protrusion of the bolt member projection, during the entire movement of the bolt member from one of said two positions to the other, when the bolt member is in the inverted position.

The guide member may be of resilient synthetic resin.

Advantageously one of the said portions of the bolt member is of circular cross section, whereby the bolt device is usable as a hinge pivot for a door, window or the like, when mounted in an end face of the door with the said one portion in engagement with a cylindrical cavity in a bushing mounted in a supporting frame of the door. Spring means acting between the guide member and the bolt member may be provided, the spring means urging the bolt member into one of said two positions. One of the said portions of the bolt member may have a bevelled end face whereby, when the bolt member is in the position in which the said one portion is outermost, the bolt device is adapted to function as a snap action latch. Again, one of the said portions of the bolt member may be of rectangular cross section whereby, when the bolt member is in the position in which the said one of the two portions is outermost, the bolt device is adapted to serve as a runner bolt for a sliding door or the like.

Preferably, the guide member is in the form of a cylindrical sleeve having longitudinally extending external reinforcing ribs adapted

to cut into a wall of a bore in a wooden component when mounting the guide member therein, whereby to secure the guide member against rotation in said bore.

5 The invention also consists in a fitting comprising a bolt device as hereinbefore defined and a bushing having a recess adapted to receive a cylindrical end portion of the bolt member. Advantageously, the recess in the  
10 bushing is eccentric to the outer periphery of the bushing, whereby rotation of the bushing, when mounted in a door supporting frame or the like enables adjustment of the position relative to the said frame, of a door, when  
15 the bolt device is mounted in the said door with the bolt member serving as a hinge pivot for movement of the said door. Preferably, the bushing has a serewdriver slot at the base of the recess or in the bushing  
20 wall at the mouth of the recess, for facilitating rotation of the bushing. The bushing may be externally screw-threaded, whereby to facilitate mounting of the bushing in a bore of the door frame or the like. The bushing may have  
25 a flange portion limiting the extent to which the bushing is screwable into the bore.

In order to make the invention clearly understood, reference will now be made to the accompanying drawings which are given  
30 by way of example and in which:—

Fig. 1 is a longitudinal sectional view of a bolt device;

Fig. 2 is a sectional view along the line II—II of Fig. 1;

35 Fig. 3 is a side view in partial section, of a bolt member of the bolt device of Figs. 1 and 2;

Fig. 4 is a view, similar to that of Fig. 1, but illustrating the bolt device with the bolt member inverted in a guide member therefor;

40 Fig. 5 is a view, similar to that of Fig. 1, but showing a modified bolt member;

Fig. 6 is a side view of the guide member of the bolt devices of Figs. 1 to 5;

45 Figs. 7 and 8 illustrate two methods of use of the bolt device of Fig. 5;

Fig. 9 is a view, similar to that of Fig. 1, but showing a modified bolt member;

Fig. 10 is a side view of the bolt device  
50 of Fig. 9;

Fig. 11 is a sectional view of a bushing in which the bolt member of Figs. 9 and 10 engages when the bolt device is in use;

55 Fig. 12 is a view, similar to that of Fig. 10, but showing the bolt member in an inverted position;

Fig. 13 is a view, similar to that of Fig. 9, but showing the bolt member in an inverted position;

60 Fig. 14 is a side view of a pivot stud forming part of a hinge pivot fitting;

Fig. 15 is a plan view of the pivot stud of Fig. 14;

Fig. 16 is a side view of another pivot

stud, similar to that of Fig. 14, but having  
65 an eccentric head;

Fig. 17 is a plan view of the pivot stud of Fig. 16;

Fig. 18 is a longitudinal sectional view of a bushing for use in conjunction with the  
70 pivot stud of Fig. 14 or 16;

Fig. 19 is an underneath view of the bushing of Fig. 18;

75 Figs. 20, 21, and 22, 23 are views, corresponding respectively to Figs. 18 and 19, of modified bushings.

The bolt device of Figs. 1 to 4 and 6, comprises a generally cylindrical guide member 2 in which a cylindrical latch member 1 is longitudinally slidable. The guide member 2 has a longitudinal slot 3 into which a projection 4 of the bolt member 1 extends. The projection 4, which serves as a handle for operating the bolt member 1, has on one face thereof, a protrusion 5 which is engagable in detent notches 6 and 6' (see Fig. 6) provided in the guide member 2 at one edge of the slot 3. The guide member 2 and the bolt member 1 are made of a tough resilient synthetic resin material and the slot 3 extends to the free end of the guide member 2 by means of a constricted opening 3' (Fig. 6), the resilient nature of the guide member 2 allowing a slight widening of the slot when the bolt member is moved out of either of the detent-held positions. The detent-held positions correspond to the two end positions of movement of the bolt member.

The projection 4 is provided non-centrally on the bolt member 1, so that by removing the bolt member 1 from the guide member 2 (by passing the projection 4 through the constricted opening 3') and inverting the bolt member 1 before re-inserting it in the guide member 2, the portion of the bolt member 1 which extends from the guide member 2 when the bolt member is moved into its upper end position as viewed in the drawings, is changed for a shorter portion which does not project so far from the free end of the guide member 2. When the bolt member 1 is inverted in this way, the detent protrusion 5 no longer engages the detent notches 6 and 6', but instead moves in an elongated recess 7 during movement of the bolt member 1 between its two end positions. A compression spring 8 is arranged between the guide member 2 and the bolt member 1 for urging the latch member 1 into its outermost end position. It will be appreciated that a single bolt member 1 can thus be used for two different engagement depths, or alternatively for detent-held or spring-urged operation.

The bolt device of Figs. 1 to 4 may be used as a hinge pivot for a door or window  
125 or other pivotally movable structure. The guide member 2 has longitudinal external ridges 16 which prevent rotation of the guide

member 2 when mounted in a bore of a door or the like.

The bolt device of Fig. 5 is generally similar to that of Figs. 1 to 4, but one end of the bolt member 1 is provided with a bevelled face 9 so that in conjunction with the compression spring 8, the device may serve as a spring latch.

Fig. 7 illustrates one manner of using such a spring bolt device. The guide member 2 is mounted in a door or the like (not shown) and the bolt member 1 cooperates with a bushing 10 recessed into a door frame or the like.

Fig. 8 illustrates another manner of using such a spring bolt device. The guide member 2 is mounted in a bore in a door 17, and the bolt member cooperates with a bushing 10 in a door frame 18, the bushing 10 at the same time serving as a stop for the door 17.

The bolt device of Figs. 9, 10, 12 and 13 is generally similar to that of Figs. 1 to 4, with the exception that while one end portion 19 of the bolt member 1 is formed cylindrically for use as a hinge pivot, the other end portion 20 of the bolt member 1 is of rectangular cross section, thus enabling the bolt device to be used as a runner bolt for sliding doors, windows and the like when the bolt member 1 is removed from the guide member 2 and reinserted therein with the end portion 20 outermost, as shown in Figs. 12 and 13.

When the bolt member 1 is in the position shown in Figs. 9 and 10 it can cooperate with a bushing 21 illustrated in Fig. 11. This bushing may be mounted in a door supporting frame and serve as a pivot socket for the cylindrical end portion 19 of the bolt member 1.

The bushing 21 of Fig. 11 has peripheral projections 23 adapted to retain it in a bore of the door frame, and a screw-driver slot 22 for enabling its rotation in the bore. The recess 24 in the bushing, in which the portion 19 of the bolt member 1 engages, is eccentric to the outer periphery of the bushing, so that by rotation of the bushing 21 the pivotal axis may be displaced and accurate adjustments thus made to the suspension position of the door relative to the door frame. Of course, a bushing such as is shown in Fig. 11 may be used also in conjunction with the bolt device of Figs. 1 to 4.

Instead of the bushing having the form shown in Fig. 11, bushings may be used which have the forms shown in Figs. 18 to 23, which will be subsequently described.

When one of the above-described devices is used as a hinge pivot for a door or window, an additional hinge pivot is required at the other end of the door or window. The additional hinge pivot may also be provided by a similar bolt device, but as it is sufficient

for one of the hinge pivots to be axially movable for inserting and removing the door or window, the additional hinge pivot may be of non-axially-movable form.

Such an additional hinge pivot may be provided by the pivot stud illustrated in Figs. 14 and 15. The pivot stud has a threaded shank 11, a cylindrical head portion 12 and a screwdriver slot 13, and is engageable in a bore of the door or the like by means of the threaded shank 11. If desired, the head portion 12 may be eccentrically arranged with respect to the shank 11, as shown in Figs. 16 and 17.

The head portions 12 of the pivot studs of Figs. 14 to 17 are engageable in recesses of bushings mounted in the door frames. Such bushings, indicated by reference numeral 10, are shown in Figs. 18 to 23. It will be seen that each bushing 10 has an external thread enabling engagement of the bushing in a bore of the door frame, and a screwdriver slot 14 at the base of the bolt member receiving recess. Of course, the screwdriver slots 14 could alternatively be provided in the bushing wall, as in Fig. 11. The bushing 10 of Fig. 22 has a flange 15 which limits the extent to which the bushing can be screwed into a bore. The recess in the bushing 10 of Fig. 18 is eccentric to the outer periphery of the bushing.

It will be appreciated that by choosing an eccentric or non-eccentric bushing for engagement by the pivot stud, which itself may be eccentric or non-eccentric, and by choosing an eccentric or non-eccentric bushing for engagement by the bolt member of the bolt device, various possibilities of adjustment of the suspension position of a door, window or the like are available.

#### WHAT I CLAIM IS:—

1. A bolt device comprising a bolt member slidably movable in a guide member therefore, the guide member being of resilient material and having a slot engaged by a projection of the bolt member to define two different positions of the bolt member, the slot in the guide member being open to the free end of the guide member by a restricted opening, the restricted opening being too narrow to allow unintended passage therethrough of the projection of the bolt member but allowing intentionally passing the projection therethrough on yielding of the guide member wall.

2. A bolt device as claimed in claim 1, wherein the portions of the bolt member at each side of the projection are of different length and/or of different cross sectional form, whereby the degree of extension of the bolt member from the guide member, when in one of the two positions, or the cross-sectional form of the extending portion is changeable by inverting the bolt member in the guide member.

3. A bolt device as claimed in claim 2, wherein a detent notch or protrusion is provided at a part of the slot, for engaging a detent protrusion or recess, respectively, on the projection of the bolt member, whereby to retain the bolt member in a predetermined position relative to the guide member.
4. A bolt device as claimed in claim 3, wherein two detent notches or detent protrusions are provided and so positioned that the bolt member is retainable selectively at the said two positions.
5. A bolt device as claimed in claim 4, wherein the detent protrusion or recess on the projection of the bolt member is provided thereon only at that face thereof which faces the edge of the slot which has the detent recesses or protrusions, respectively, when the bolt member is in its non-inverted position, whereby on inversion of the bolt member in the guide member, the retaining action is not exercised.
6. A bolt device as claimed in claim 5, wherein the other edge of the slot has a longitudinally extending recess of a length sufficient to accommodate the detent protrusion of the bolt member projection, during the entire movement of the bolt member from one of said two positions to the other, when the bolt member is in the inverted position.
7. A bolt device as claimed in any one of claims 2 to 5, wherein the guide member is of resilient synthetic resin.
8. A bolt device as claimed in any one of claims 2 to 7, wherein one of the said portions of the bolt member is of circular cross section, whereby the bolt device is usable as a hinge pivot for a door, window or the like, when mounted in an end face of the door with the said one portion in engagement with a cylindrical cavity in a bushing mounted in a supporting frame of the door.
9. A bolt device as claimed in any one of claims 2 to 8, wherein spring means acting between the guide member and the bolt member are provided, the spring means urging the bolt member into one of said two positions.
10. A bolt device as claimed in claim 9, wherein one of the said portions of the bolt member has a bevelled end face whereby, when the bolt member is in the position in which the said one portion is outermost, the bolt device is adapted to function as a snap action latch.
11. A bolt device as claimed in any one of claim 2 to 9, wherein one of the said portions of the bolt member is of rectangular cross section whereby, when the bolt member is in the position in which the said one of the two portions is outermost, the bolt device is adapted to serve as a runner bolt for a sliding door or the like.
12. A bolt device as claimed in any one of claims 1 to 11, wherein the guide member is in the form of a cylindrical sleeve having longitudinally extending external reinforcing ribs adapted to cut into a wall of a bore in a wooden component when mounting the guide member therein, whereby to secure the guide member against rotation in said bore.
13. A fitting comprising a bolt device as claimed in any one of claims 1 to 12, and a bushing having a recess adapted to receive a cylindrical end portion of the bolt member.
14. A fitting as claimed in claim 13, wherein the recess in the bushing is eccentric to the outer periphery of the bushing, whereby rotation of the bushing, when mounted in a door supporting frame or the like, enables adjustment of the position relative to the said frame, of a door, when the bolt device is mounted in the said door with the bolt member serving as a hinge pivot for movement of the said door.
15. A fitting as claimed in claim 14, wherein the bushing has a screwdriver slot at the base of the recess or in the bushing wall at the mouth of the recess, for facilitating rotation of the bushing.
16. A fitting as claimed in claim 15, wherein the bushing is externally screw-threaded, whereby to facilitate mounting of the bushing in a bore of the door frame or the like.
17. A fitting as claimed in claim 16, wherein the bushing has a flange portion limiting the extent to which the bushing is screwable into the bore.
18. A fitting adapted for use in conjunction with a fitting as claimed in any one of claims 13 to 17, for providing an additional hinge pivot for a door or the like, comprising a stud having a screw-threaded portion by which it is mountable in a bore in a door or the like and an end portion adapted to engage in a recess in a bushing, the bushing being as defined in any one of claims 13 to 17.
19. A fitting as claimed in claim 18, wherein the end portion of the stud is eccentric to the screw-threaded portion thereof.
20. A fitting as claimed in claim 18 or 19, wherein the end portion of the stud has a screwdriver slot for facilitating rotation of the stud.
21. Bolt devices constructed, arranged, and adapted to operate substantially as hereinbefore described with reference to and as illustrated in Figs. 1 to 13 of the accompanying drawings.
22. Fittings constructed and arranged substantially as hereinbefore described with reference and as illustrated in Figs. 14 to 23 of the accompanying drawings.
- WALTHER WOLFF,  
78, Woodlands, London, N.W.11,  
Chartered Patent Agent.

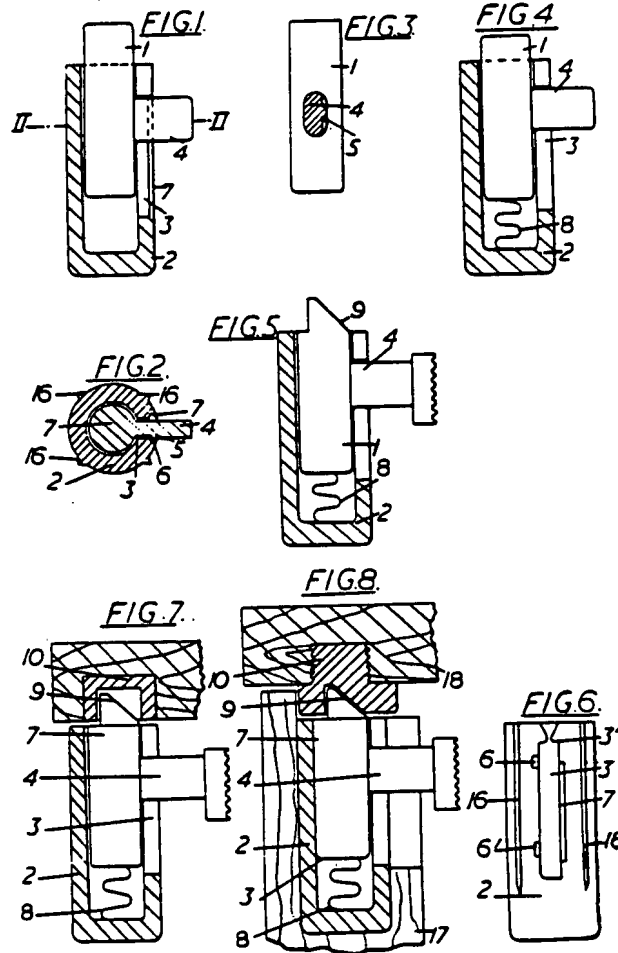
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COMPLETE SPECIFICATION

3 SHEETS

This drawing is a reproduction of  
the Original on a reduced scale

Sheet 1



## ERRATA

SPECIFICATION No. 937,944

Page 1, line 85, *for* "engagable" *read*  
"engageable"  
Page 3, line 69, *after* "of" *insert* a comma  
Page 3, line 60, *after* "above-described" *insert*  
"bolt"  
Page 3, line 105, *after* "like" *insert* a comma  
Page 3, lines 117 and 118, *for* "intentially"  
*read* "intentionally"  
Page 4, line 56, *for* "claim" *read* "claims"  
Page 4, line 88, *for* "faciliating" *read*  
"facilitating"

THE PATENT OFFICE  
28th October 1963